

## REMARKS

Applicants acknowledge with thanks the suggestion in Item 4 of the Office Action that a heading "Brief Description of the Drawings" be added to the specification. The Applicants have amended the specification accordingly.

In Item 5 of the Office Action, previous claim 25 was objected to under 37 CFR 1.75(c) as being in improper form. Claim 25 has been amended to remove the dependency on claim 24 in order to overcome this objection.

In Items 6-7 of the Office Action, claims 1-8, 11-14, 17-25 and 27-30 were rejected under 35 U.S.C 112, second paragraph as being indefinite. In particular, it was noted that compound A8 did not have the variable R defined. A new independent claim, claim 38, has been added which is directed to the dendrimer shown in Figure 4 of the present application and referred to as A-8. The definition of R in claim 38 is taken from page 12, lines 2-3 of the specification. New dependent claim 39 (which depends from claim 38) limits the dendrimer of claim 38 to compounds where R is 2-ethylhexyl, i.e., to the specific Example 7 compound. See page 19, lines 10-13 of the specification. The Applicants have also added new claims 40-48 that depend from new independent claim 38. Claims 40-48 have a basis in claims 21, 22, 23, 24, 25, 27, 28, 29, 30, respectively. The dendrimer of new independent claim 38 was noted in Item 9 of the Office Action as being allowable subject matter. Accordingly, it is submitted that new independent claim 38 and new claims 39-48 that depend thereon are in condition for allowance.

In Item 8 of the Office Action, claims 1-8, 11-14, 17-25 and 27-30 were objected to for containing non-elected subject matter. The Applicants have amended the claims to overcome this objection as follows.

Claim 1 has been amended to refer to an organometallic dendrimer of Formula (II) which was recited in previous claim 2. As can be appreciated, by virtue of the fact that subscript "y" represents an integer of 2 or more, amended claim 1 necessarily relates to "double dendron" dendrimers, i.e., those which contain two or more dendrites on each coordinating group X. As a result of this amendment to claim 1, the feature of the dendrimer having a structure in which no hemisphere is devoid of a first single bond has been deleted from the claim. Basis for this deletion is found in the specification at page 5, lines 19 to 27 which show that this required spatial distribution can be achieved by utilizing dendrimers of Formula (II). For reference, amended claim 1 is now the same as claim 1 which granted in Europe.

As a result of the amendments to claim 1, previous claim 2 has been cancelled. In addition, claims 12 and 13 have been amended to recite that each coordinating group X terminates in the first single bond to the dendron, rather than CORE terminating in this bond. This amendment is due to the replacement of Formula (I) in claim 1 with Formula (II). The status of claims 14 to 37 is the same as in the previous response.

By assessing the meaning of amended claim 1, clear distinctions can be seen between the claimed invention and the prior art. In the case of the claims previously on file, these contained the feature that the claimed dendrimers had a structure in which no hemisphere of a notional sphere centred on M and containing the dendrimer was devoid of a said first single bond. This feature has now been deleted because it is redundant in view of the limitation to dendrimers of formula (II) in claim 1. The claims thus now require dendrimers of formula (II) in which, in particular, y represents an integer of 2 or more. The combination of these requirements means that the claimed dendrimers

contain coordinating groups X which bear at least two dendrites each. In the terminology used by the inventors, the claimed dendrimers are therefore "double dendron dendrimers", and can be referred to as being "double dendronised". These claimed dendrimers can therefore be contrasted with the "single dendron dendrimers" or "singly dendronised" dendrimers.

The contrast between double and single dendron dendrimers can be seen by comparing Figures 2 and 4, 5 and 6 of the present application. Figure 2 relates to "single dendron dendrimers", see in particular dendrimer "1" and dendrimer "2" in Figure 2. These contain a central iridium complexed to three phenylpyridyl ligands. In the terminology of present claim 1, "M" is iridium, and each "X" is phenylpyridyl. The phenylpyridyl ligands each bear one dendritic structure on the phenyl portion of the ligand. The dendritic structure corresponds to "Q" in claim 1. However, because each phenylpyridyl ligand bears only a single dendritic structure, this would require the variable "y" in present claim 1 to be 1. It will be noted that "y" in amended claim 1 must, however be an integer of 2 or more. Thus, the dendrimers shown in Figure 2 are outside the scope of amended claim 1.

In contrast to the dendrimers of Figure 2, exemplary dendrimers of the present invention are shown in Figures 4, 5 and 6. Referring first to Figure 4, dendrimer A-8 again contains a central iridium complexed to three phenylpyridyl ligands. Again, therefore, in the terminology of amended claim 1, "M" is iridium, and each "X" is phenylpyridyl. However, in Figure 4 the phenylpyridyl ligands each bear two dendritic structures, one on the phenyl portion of the ligand and one on the pyridyl portion of the ligand. Thus, variable "y" is 2, and the dendrimer falls within the scope of amended

claim 1. The same analysis can be performed to show that dendrimers B-4 and C-5 in Figures 5 and 6 also fall within the scope of amended claim 1. The dendrimers of Figures 4, 5 and 6 are "double dendron dendrimers".

From the above analysis a clear distinction can be seen between "single dendron dendrimers" and the claimed "double dendron dendrimers". This distinction provides novelty for amended claim 1 and all other claims that either refer back to or depend from amended claim 1. In addition, this distinction provides an unexpected technical benefit and represents a non-obvious modification of the prior art. In particular, this special spatial arrangement of the dendrites around the core effectively "shields" the core to a greater degree. As discussed in our previous response, this advantageously minimizes undesirable intermolecular core-core interactions and thereby improves the photoluminescence quantum yields of the dendrimers. There are, therefore, clear advantages conveyed by use of the claimed "double dendron dendrimers".

From the above discussion, it can be seen that a technical feature in the present case is provision of double dendron dendrimers. This subject matter is novel and non-obvious, and defines a contribution made by the claimed invention over the prior art. The technical feature identified above is common to all claims, because all claims have the requirement that "y" is 2 or more, and hence all require that the dendrimers are double-dendronised. This should be regarded as a significant structural element shared by all of the alternatives.

It is noted that paragraph 9 of the Office Action indicates that the common feature of the current claims represents patentable subject matter. As the Examiner quite rightly notes, "[i]n the prior art, Markham (Applied Physics Letters, cited on

applicants form 1449) discloses compounds of formula 3 (see page 2646) which are closely related to the instant compounds. However, *the compounds of Markham differ from the instant compounds in having unsubstituted pyridine rings instead of phenyl-substituted pyridine rings* and, furthermore, there is no teaching, suggestion or motivation in the prior art to modify the compounds of Markham to prepare the instant compounds" (emphasis added).

The Examiner's assessment repeated above agrees with the Applicant's position that the feature of double-dendronised dendrimers represents the inventive contribution made by the invention over the prior art.

Therefore, it is respectfully submitted that amended claim 1 and claims 3-8, 11-14, 17-25 and 27-30 that depend thereon are in condition for allowance.

#### Conclusion

The extension fee has been submitted herewith. Having paid for 25 total and 3 independent claims, the fee for the 15 extra claims has been submitted herewith. No other fees are believed to be needed for this amendment. However, if other fees are needed, please charge them to Deposit Account No. 17-0055.

Respectfully submitted,

For David William Samuel *et al.*

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